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Author: Shannon Purdue			

Environmental Restoration Project
Standard Operating Procedure

for:

Surface Water Sampling

Los Alamos

NATIONAL LABORATORY

Los Alamos, New Mexico 87545

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Revision Log

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Surface Water Sampling

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Surface Water Sampling

1.0 PURPOSE

This Standard Operating Procedure (SOP) describes the process for collection of surface water samples at the Los Alamos National Laboratory (Laboratory) Environmental Restoration (ER) Project.

2.0 SCOPE

- 2.1 This SOP is a mandatory document and shall be implemented by all ER Project personnel when collecting surface water samples for the ER Project
- 2.2 Subcontractors performing work under the ER Project's quality program shall follow this SOP for collecting surface water samples or may use their own procedure(s) as long as the substitute meets the requirements prescribed by the ER Project Quality Management Plan, and is approved by the ER Project's Quality Program Project Leader (QPPL) before the commencement of the designated activities.

3.0 TRAINING

- 3.1 ER Project personnel using this SOP are trained by reading the procedure, and the training is documented in accordance with QP-2.2.
- 3.2 The **Field Team Leader** (FTL) shall monitor the proper implementation of this procedure and ensures that relevant team members have completed all applicable training assignments in accordance with QP-2.2.

4.0 DEFINITIONS

- 4.1 Grab samples — A specific location at a given time is represented by a discrete aliquot. The sample is collected all at once and at only one particular point in the sample medium.
- 4.2 Site-Specific Health and Safety Plan (SSHASP) — A health and safety plan that is specific to a site or ER-related field activity that has been approved by an ER health and safety representative. This document contains information specific to the project including scope of work, relevant history, descriptions of hazards by activity associated with the project site(s), and techniques for exposure mitigation (e.g., personal protective equipment [PPE]) and hazard mitigation.

- 4.3 Surface water samples)— Water collected from streams, ponds, lagoons, seeps, springs, rivers, lakes, or other waterflowing or impounded at the ground surface comprise surface water samples.

5.0 BACKGROUND AND PRECAUTIONS

- 5.1 This SOP shall be used in conjunction with an approved SSHASP. Also, consult the SSHASP for information on and use of all PPE.
- 5.2 One method for collecting a surface water sample is to use a peristaltic pump. The pump system allows the union of the filtration assembly with the pump and the sample container. With this method, surface samples are filtered if needed, and collected directly with minimal elapsed time. The acceptable tubing is medical grade silicon, which is deconned according to ER SOP-1.08 or replaced after every sample.
- 5.3 An alternative method is to collect surface water as grab samples. Samples can be collected using a transfer device constructed of Teflon™, stainless steel, or glass. The transfer device is used to transfer liquid and liquid wastes from surface waters to a sample bottle. In general, field personnel must avoid using metal transfer devices for trace-metal analysis or plastic devices for sampling trace organics.
- 5.4 The water sample can also be collected directly by dipping the collection bottle into the water and filling, removing, and capping it. This method requires the exterior of the sample container to be rinsed after collection to avoid spreading possible contamination.

6.0 RESPONSIBLE PERSONNEL

The following personnel are responsible for activities identified in this procedure.

- 6.1 ER Project Personnel
- 6.2 Field Team Leader
- 6.3 Sample Management Office
- 6.4 Subcontractors

7.0 EQUIPMENT

- 7.1 A checklist of suggested equipment and supplies needed to implement this procedure is provided in Attachment A.

8.0 PROCEDURE

Note: ER Project personnel may produce paper copies of this procedure printed from the controlled-document electronic file located at http://erinternal.lanl.gov/home_links/Library_proc.htm. However, it is each person's responsibility to ensure that they trained to and utilize the current version of this procedure. The author may be contacted if text is unclear. The Document Control Coordinator (DCC) may be contacted if the author cannot be located.

8.1 Document Procedure Deviations

Deviations from SOPs are made in accordance with QP-4.2, Standard Operating Procedure Development, and documented in accordance with QP-5.7, Notebook Documentation for Environmental Restoration Technical Activities.

8.2 Notify the Sample Management Office

Coordinate the sampling effort with the Sample Management Office (SMO). The SMO will give guidance regarding sample containers, preservation, and shipment to the SMO.

8.3 Use a Planning Document

Refer to the site work plan, sampling plan, field implementation plan, or other appropriate plan to locate the sampling sites along the surface water body and the appropriate decontamination area.

8.4 Calibrate Instruments

Measuring and test equipment is controlled in accordance with QP-5.2, Control of Measuring and Test Equipment. Calibrate Instruments to be used for water quality readings. (If field chemistry readings are required). Refer to SOP-6.02, Field Analytical Measurements of Groundwater or the instrument's operators manual for calibration requirements and instructions.

8.5 Record Calibration Process

Record calibration and instrument model information in Field Notebook or Daily Activity Log.

8.6 Implement Decontamination Process

Decontaminate all sampling equipment before taking the first sample and between sampling intervals in accordance with SOP 1.08, Field Decontamination of Drilling and Sampling Equipment.

8.7 Sample by using a Sampling Transfer Device or by Direct Grab Method

If sampling with a transfer device or by direct grab method, follow the procedure outlined below:

- 8.7.1 Review SOP 1.02, Sample Containers and Preservatives for the appropriate size of sample containers and preservatives.
- 8.7.2 Use the transfer device to fill the sample containers slowly.
- 8.7.3 When transferring liquid, the sample stream should flow gently down the sidewall.
- 8.7.4 For sampling some distance offshore, an extension device might be required.
- 8.7.5 Decontaminate transfer device according to SOP-1.08, Field Decontamination of Drilling and Sampling Equipment, or handle device as contact waste according to SOP-1.06, Management of ER Project Wastes.
- 8.7.6 Label sample containers and complete documentation (SOP-1.02, Sample Containers and Preservation, and SOP-1.04 Sample Control and Documentation).
- 8.7.7 Perform field chemistry measurements on surface water being sampled (if required).
- 8.7.8 Record the final, stable parameter readings on the Sample Collection Log or equivalent form for later submittal to the Records Processing Facility.
- 8.7.9 If water is collected directly into the collection bottle, add preservatives after the sample is collected.
- 8.7.10 Preserve and store the sample in accordance with SOP 1.02.
- 8.8 Use a Peristaltic Pump
 - If sampling with a peristaltic pump, follow the procedure outlined below:
 - 8.8.1 Review SOP 1.02, Sample Containers and Preservatives for the appropriate size of sample containers and preservatives.
 - 8.8.2 Install clean peristaltic pump tubing according to the manufacturer's instructions.
 - 8.8.3 Place intake end of the tubing into the water to be sampled and turn on the pump.
 - 8.8.4 Keep the tubing away from the bottom to minimize the amount of sediment collected.
 - 8.8.5 Fill the bottles without agitating the water if possible.
 - 8.8.6 To collect filtered samples, connect the appropriate filter to the outlet end of the pump tube.

- 8.8.7 Before collecting filtered samples, run a few hundred millilitres of water through the filter.
 - 8.8.8 Label and preserve sample containers and complete documentation (SOP-1.02, Sample Containers and Preservation, and SOP-1.04 Sample Control and Documentation).
 - 8.8.9 Perform field chemistry measurements on surface water being sampled (if required).
 - 8.8.10 Record the final, stable parameter readings on the Sample Collection Log or equivalent form for later submittal to the Records Processing Facility.
- 8.9 Use a Reference Marker
- Place a reference marker (e.g., a wooden or metal stake with flagging) that includes the location identification number as close to the sampling location as possible.
- 8.10 Perform Lessons Learned
- During the performance of work, **ER Project personnel** shall identify, document, and submit lessons learned, as appropriate in accordance with QP-3.2, Lessons Learned, located at http://erinternal.lanl.gov/home_links/Library_proc.htm.

9.0 REFERENCES

ER Project personnel using this procedure should become familiar with the contents of the following documents to properly implement this SOP.

- ER Project Quality Management Plan located at http://erinternal.lanl.gov/home_links/Library_proc.htm.
- QP-2.2, Personnel Orientation and Training
- QP-4.2, Standard Operating Procedure Development
- QP-5.2, Control of Measuring and Test Equipment
- ER-SOP-1.02, Sample Procedure Development
- ER-SOP-1.04, Sample Control and Field Documentation
- ER-SOP-1.06, Management of Environmental Restoration Project Wastes
- ER-SOP-1.08, Field Decontamination of Drilling and Sampling Equipment
- ER-SOP-6.02, Field Analytical Measurements of Groundwater

- Berg, E.L. 1982 "Handbook for Sampling and Sample Preservation of Water and Wastewaters" (U.S. Environmental Protection Agency report EPA-600/4-82-029. U.S. Government Printing Office, Washington D.C.)
- EPA 1979, "Methods of Chemical Analysis of Water and Wastes," (U.S. Environmental Protection Agency report EPA-600/4-79-020. U.S. Government Printing Office, Washington D.C.)
- Korte, N., and P. Kearl. 1984. "Procedures for the collection and Preservation of Ground-water and Surface Water Samples and for the Installation of Monitoring Wells" (Bendix Field Engineering Corporation Report, Grand Junction, CO)
- EPA Region IV, "Environmental Compliance Branch Standard Operating Procedures and Quality Assurance Manual," (Environmental Services Division, Athens, GA, 1991).

10.0 RECORDS

The **FTL** is responsible for submitting the following records (processed in accordance with QP-4.4, Record Transmittal to the Records Processing Facility) to the Records Processing Facility.

10.1 Sample Collection Logs

10.2 Chain of Custody/Request for Analysis Forms

10.3 Daily Activity Log or Completed Field Notebook

11.0 ATTACHMENTS

Attachment A: Equipment and Supplies Checklist for Surface Water Sampling
(1 page) <http://erinternal.lanl.gov/Quality/users/forms.asp>.

Equipment and Supplies Checklist For Surface Water Sampling

- ☐ Peristaltic pump
- ☐ Filtration unit
- ☐ Filters
- ☐ Transfer Device (if needed)
- ☐ Wooden Stakes
- ☐ Flagging
- ☐ Bucket
- ☐ Stopwatch
- ☐ Sample Containers and Preservatives
- ☐ Water Quality Meters
- ☐ Disposable gloves
- ☐ Safety Glasses
- ☐ Sample Collection Logs
- ☐ Chain of Custody/Request for Analysis Forms
- ☐ Custody Seals
- ☐ Sample Container Labels
- ☐ Tubing for pump
- ☐ Ph Strips
- ☐ Preservatives
- ☐ Coolers (Appropriately labeled)
- ☐
- ☐
- ☐
- ☐
- ☐

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